

C101 Pathological structures on gill and kidney of *Carassius auratus* in a sewage disposal plant of Jeonju stream

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Gill and kidney of *Carassius auratus* are used to investigate the water pollution an effect on aquatic organisms which inhabits a sewage disposal plant of Jeonju stream, Mangyeong River. Around the sewage disposal water temperature are high and pollutants inflow frequently. In the above environmental condition, *C. auratus* shows abnormal structures in the gill: Oedema of primary gill lamella, epithelial lifting or separation, complete necrosis, increase of secondary lamellar thickness, lamellar hypertrophy, hyperplasia and secondary gill lamellar fusion. The kidney has abnormal structure: acute tubular necrosis, shrunken renal tubules and glomerulus, thickened capillary basement membrane of the renal glomerulus. In addition, the kidney shows pathological structures such as enlarged melanomacrophage centres with golden and dark brown pigments, vacuoles and giant cells.

C102 Structure and histochemistry of the respiratory skin of a torrent catfish, *Liobagrus mediadiposalis*

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The epidermis of the torrent catfish, *Liobagrus mediadiposalis* was divided into three layers: the outermost layer, middle layer and stratum germinativum. The epidermis consisted of two types of skin glands, a small mucous cell and voluminous club cell. The unicellular mucous cell was acid sulfomucins (some sialomucins) and

the club cell, sometimes binucleate, was proteinaceous. Well-developed vascularization was one of the characteristic of epidermis of *L. mediadiposalis*. Vascular capillary networks are present in the mid-epidermis and the distance between the vascular capillaries and the surface of epidermis was $169\mu\text{m}$, and average ranging from 22.5 to $220\mu\text{m}$. Well-developed lymphatic spaces contained lymphocytes in the epidermis. The dermis lacks scale and consists mostly of a thick dense connective tissue; its superficial region just below the basal membrane was supplied with fine blood capillaries. These histological features of the skin in *L. mediadiposalis* are closely related to cutaneous respiration.

C103 Scanning Electron Microscopical Studies of the Haemocytes of Mealworm Beetle, *Tenebrio molitor*;

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Tenebrio molitor were investigated using histochemical method, fine structural observation with electron microscopes. The hemocytes of the mealworm, *Tenebrio molitor* were classified into 2 main groups: granulocytes and non-granulocytes. The granulocytes were divided into two subtypes: eosinophilic granulocytes, basophilic granulocytes. Eosinophilic granulocytes contained small granules. The granules of basophilic granulocytes were larger than granules of eosinophilic granulocytes. On the other hand, the non-granulocytes were divided into 3 subtypes: prohemocytes, plasmatocytes, Oenocytoids. Prohemocytes were the smallest of the cell types with a smooth outline. The surface structures of the spindle-shaped, leaf-shaped plasmatocytes were observed. Oenocytoids were large with a very big nucleus.